

**METHOD AND APPARATUS FOR WORD SYNCHRONIZATION WITH  
LARGE CODING DISTANCE AND FAULT TOLERANCE FOR PRML  
SYSTEMS**

Abstract of the Disclosure

5           A method and apparatus are provided for word synchronization with  
large coding distance and fault tolerance for a partial-response maximum-  
likelihood (PRML) data channel in a direct access storage device (DASD). A  
Viterbi detector receives equalized PR4 samples including a predefined word  
synchronization pattern. The Viterbi detector is a dedicated detector  
10       optimized for detecting the predefined word synchronization pattern. The  
Viterbi detector includes a two-state Viterbi trellis and a word synchronization  
detector for the two-state Viterbi trellis. The predefined word synchronization  
pattern includes only even length magnets. The predefined word  
synchronization pattern is a repetition code including pairs of ones and pairs  
15       of zeros and includes multiple pattern match sequences. The Viterbi  
detector is optimized with branches removed from the Viterbi trellis, thus  
increasing coding distance. The two-state Viterbi trellis and word  
synchronization detector of the Viterbi detector operate on a 2T basis, where  
1/T is the sample rate.